

PROCEEDINGS
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NEW SPIROBOLOID DIPLOPODS.

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In working over a collection of diplopods from Claremont, Cal., sent me for identification by Prof. W. A. Hilton, several unnamed forms were found. Preliminary accounts of these and three other new forms from the same State are given below in order that the names may be validated for early use. The typical material is all at the Museum of Comparative Zoology, Cambridge.

SPIROBOLIDAE.

Tylobolus claremontus, sp. nov.

Readily distinguishable from other species in the form of the male gonopods. In these the anterior median plate is broadly triangular, much narrower across the distal end than in *T. deses* and the tip attaining the level of the distal ends of the anterior coxal plates. The latter are distally depressed, the distomesal corner oblique, not at all elevated or produced. Tips of telopodites of anterior pair bent caudad and then ectad, somewhat uncate. Telopodite of posterior gonopods strongly uncate as usual; the distal spine more elongate and curved than in *uncigerus*, not pilose, and lacking any lobe at base such as present in *deses*. General color brown; each segment with a black annulus in front of suture, and also darkened along caudal border or not; in one specimen the dark brown to reddish brown bands about the caudal borders are conspicuous while in front of the sutures the segments are scarcely at all darkened; anal valves and collum dusky; legs fulvous. Clypeal foveolae 5+5 or sometimes 6+6, counting a smaller one a little above the level of the others on each side. Collum angularly narrowed below; anterior margin flattened or very slightly concave opposite cardo. Second somite extending well below level of collum, the ventrocaudal corner of lower part oblique, the anterior vertical. Surface of somites in general densely punctate in front of suture with the usual associated short striae,

giving the appearance of being finely rugose, the punctae more sparse on metazonites. Sutures deeply impressed. Mesal borders of anal valves protruding prominently. Third legs of male with the usual large uncate process on coxa, the anterior or distal end of hook blunt, rounded. Coxae of next four pairs of legs with smaller, flattened processes which decrease in size in going caudad. Segments forty-two to forty-five in number.

Length (male), near 58 mm.; width, 7 mm.

Locality.—California: Claremont. (W. A. Hilton).

***Tylobolus castaneus*, sp. nov.**

Of a chestnut or, sometimes, of a brighter, cherry red, color, the color in an annulus along caudal border deeper; antennae brown; legs pale brown to fulvous. Aside from the characteristic coloration to be distinguished especially by the structure of the male gonopods. The anterior median plate proportionately much broader than in *uncigerus*, with the lateral margins evenly convex, not at all angulated as in *deses*, its apex but little exceeded by the anterior coxal plates which rise in a slight rounded process at the distomesal angle. Anterior telopodites distally narrow, somewhat uncate at tip in the usual way. The telopodites of posterior gonopods narrowed more gradually than usual to an acute point, the distal process scarcely spiniform, not pilose but finely scabrous, short. Cephalic sulcus widely interrupted in the frontal region. Clypeal foveolae 4+4. Dental prominences in labral sinus rounded, 3+3. Collum narrowly rounded below. Anterior margin a little concave just above lower end, convex on opposite caudal side. Second segment produced below as usual, the ventral margin excavated behind so that the anterior half bulges, the anteroventral corner protruding as a strongly rounded process. Surface of segments roughened by numerous short impressed lines, coriarius. Sutures sharply impressed. Number of segments, forty-seven.

Length (male), near 40 mm.; width, 5 mm.

Locality.—California: Brookdale. (R. V. Chamberlin).

***Hiltonius*, gen. nov.**

Differs from *Spirobolus* and agrees with *Tylobolus* in lacking a free inner piece to the posterior gonopods. Differs from *Tylobolus* in having the telopodite of posterior gonopods erect, not at all uncate and not terminating in a narrow distal process or spine, the mesal margin dentate. Coxal lobes of anterior gonopods tuberculate on anterior face mesally and on mesal face as in *Tylobolus*. Coxae of third legs of male with prominent, distally expanded or somewhat uncate processes; the succeeding four pairs also with coxal eminences, these decreasing in going caudad. Genotype.—*H. pulchrus*, sp. nov.

***Hiltonius pulchrus*, sp. nov.**

General color bright brown with the caudal border of each segment annulate with black; collum bordered with black in front as well as be-

hind; head, antennae and legs brown. Sulcus of head widely interrupted in the frontal region. Clypeal foveolae 4+4. Upper clypeal region a shallow depression on each side. Antennae reaching to second segment. Collum moderately concave or excavated in front for reception of cardo of mandibles. Lower end rounded. Second segment extending well below level of collum on each side, the part below collum with lower and anterior margins straight. Surface of segments punctate, with fine, short, mostly longitudinal lines proceeding from the punctae. Covered part of prozonites with few but distinct transverse striae. Sutures distinct throughout, bending a little forward toward pores, which are small. Anal valves moderately protruding caudad but not at all margined; exceeding the anal scutum. The free inner edge of basal or coxal plate of anterior gonopods a little shorter than the length of the median plate, with a short blunt process at distomesal angle; the telopodite distally narrowly rounded, not at all bent or uncate. Posterior telopodites concave on posterior surface distally—distal end rounded, the edges finely dentate, the mesal edge with a prominent angle at proximal end of concave region; no free median or inner piece. Number of segments fifty-three.

Length (male), near 80 mm.; width, 8 mm.

Locality.—California: Claremont. (W. A. Hilton.)

ATOPETHOLIDAE, fam. nov.

In this family the anterior median plate of the gonopods of male is reflexed from distal end up on the caudal side, the caudal extension commonly continued above in more membranous form and coming into more or less intimate relationship with the bases of the posterior gonopods. Posterior gonopods with telopodite simple and mostly blade-like with no separate inner piece; basal region often more or less extended mesad at an angle suggestive of condition in the Trigonulidae. In most forms, at least, the telopodite of anterior gonopods distinctly articulated; short and broad, with a finger-like or distally expanded process from distal or mesal edge. The members of this family are easily recognizable among other North American *Spiroboloids* by the form of the collum which is acutely narrowed on each side below; caudal margin nearly straight above these lateral processes, not much bowed caudad as in *Spirobolus*, etc.; while the second segment is not at all produced below the level of the collum. The family includes, in addition to *Atopetholus* and *Hesperolus*, the two new genera described below, also *Onychelus*, *Eurelus*, and related genera of the southwestern United States and Mexico.

Atopetholus, gen. nov.

In this genus the anterior median plate of the male gonopods is shorter and broader than in *Onychelus*. The telopodite of the anterior gonopods short and broad but exceeding the coxal plate; with a conspicuous, digitiform, distally moderately expanded and rounded process from the mesal or distal edge extending caudad more or less at right angles to the general

surface. Telopodite of posterior gonopods a rather slender, strongly chitinous, curved blade with broader basal region extended mesad; the telopodite much larger than in *Onychelus* and *Hesperolus*; at apex simply notched or with a small angle or tooth just proximad of the rounded apex. First two to four pairs of legs of male crassate and with the claws hypertrophied; other anterior legs with claws normal in size. Coxae of third legs of male with conspicuous, simple, subconical processes which do not exceed in size those of the coxae of the next four pairs. Mesal margins of anal valves meeting in a groove.

Genotype.—*A. californicus*, sp. nov.

***Atopetholus californicus*, sp. nov.**

General color brown with an annulus of black a little in front of caudal margin of each segment, the color along which remains light; legs dark brown, more fulvous proximally. Anal scutum and valves dusky or black. Collum also dusky, somewhat paler in median region. Sulcus of head complete, not interrupted. Setigerous foveolae, 5+5. Antennae reaching to third segment. Collum strongly narrowed ventrad, the lower end acute; margined in front up to level of eye on each side; anterior margin slightly concave opposite each cardo. Second segment on a level below with lower end of collum in male, often exceeded by latter in female. Segments furrowed along position of suture, which is not itself distinct. Several transverse striae in front of position of suture, the most caudal of these especially well marked and taking its origin low down on the side from the suture proper. Metazonites lightly finely punctate, the prozonites more vaguely so. Anal valves broadly convex, not compressed, caudally flattened. Claws of first two pairs of legs of male as long as last tarsal joint; those of other legs smaller, of normal or nearly normal size. Number of segments, forty-eight.

Length (male), near 52 mm.; width, 5 mm.

Locality.—California: Claremont. (W. A. Hilton.)

***Atopetholus parvus*, sp. nov.**

Easily distinguishable, aside from coloration, much smaller size, etc., by the different structure of the gonopods of male. A conspicuous feature in these is that the telopodites of the posterior gonopods are much larger and protrude widely beyond the anterior gonopods, being bent caudad below and beyond telopodites of latter. The anterior median plate is similar but is distally narrower and extends farther distad. The telopodite of anterior gonopods shorter than in the genotype, somewhat semicircular in outline with the process arising from the distal edge, not from the mesal edge. Segments in general blackish; a narrow light stripe along caudal margin of each segment, especially in anterior region; the prozonites on sides and in a spot just above level of pore may be areolated with numerous small light dots. Collum over median region with a close network of dark lines over a fulvous background, a submarginal band of black all around; legs fulvous; anal scutum black except-

ing a narrow caudal border; anal valves dark. Sulcus of head narrowly interrupted in frontal region. Clypeal foveolae 5+5. Collum as in *californicus*; extending, in male, a little below level of second tergite. Segments with a sharply impressed stria across dorsum just caudad of covered region of prozonite much as in the preceding species. Surface similar. Claw of first legs in male as long as last joint, that of the second shorter. Number of segments, forty-two.

Length (male), near 27 mm.; width, 3.25 mm.

Locality.—California: Claremont (W. A. Hilton).

Atopetholus fraternus, sp. nov.

Easily separable from the two preceding species in the form of the male gonopods. The telopodite of the anterior gonopods is bent convexly forward at the side where it bears at the anterodistal angle a straight, simple, process additional to the caudally directed one arising from the distomesal edge behind, this feature at once separating it from the preceding species. The telopodites of the posterior pair proportionately larger than in *californicus* but smaller than in *parvus*, crossing in the middle line, rather broad, thin at the edges, concave above. Median plate straight across distal end, much exceeded by the coxal plates. Color dark olive gray with a deeper, black or dark olive annulus about the caudal border, the extreme edge, however, pale. Antennae dark olive to black. Legs dark brown. Sulcus of head interrupted in frontal region. Clypeal foveolae 5+5. Collum narrowed below as usual, the process narrowly rounded; concave or excavated on caudal side just above lower end and strongly concave in front opposite cardo as usual; margining sulcus in front not extending dorsad fully to level of eye, diverging from margin at upper end; surface subdensely finely punctate. Surface of segments in general similar to that of collum. Each segment constricted, the furrow rather wide, the pore lying in it and the suture at its caudal edge. Suture curved at level of pore. First two pairs of legs in male strongly thickened, their claws enlarged as usual; the third and fourth pairs of intermediate thickness and their claws correspondingly intermediate in size. Processes of coxae of third to seventh legs subconical, smooth, those of the third pair largest. Number of segments, forty-one or forty-two.

Length (male), near 33 mm.; width, 4 mm. Width of female, 5 mm.

Locality.—California: Friant. (R. V. Chamberlin.)

Hesperolus, gen. nov.

Resembling *Onychelus* and *Atopetholus* in general structure. Agrees with the former and differs from the latter in lacking processes on the coxae of the third and succeeding anterior legs in the male. Unlike *Onychelus* the claws in the male are especially large on only the first two pairs of legs, which are enlarged, the claws of the other anterior legs of normal size, or those of the third pair a little more elongate. Differ-

ing from both the genera mentioned in the greater simplicity and reduction of the telopodite of posterior gonopods, which is very short, distally rounded, not blade-like and not strongly chitinized. The anterior median plate distally broad much as in *Atopetholus* but extending farther distad. Coxal pieces of anterior gonopods broad, without processes. Telopodite of anterior gonopods distinctly articulated; narrowed distally into a short, distally rounded but not expanded process which lies in the general plane of the plate, not extending caudad from it as in *Atopetholus*.

Genotype, *H. wheeleri*, sp. nov.

***Hesperolus wheeleri*, sp. nov.**

A species much smaller than those known in *Atopetholus* and *Onychelus* excepting *O. hospes*, an Arizonan species. From that species, aside from generic differences evident in the male, distinguishable in having the repugnatorial pore in front of the constricting furrow of the segment, not behind it. General color brown, the caudal borders and covered part of segments fulvous. Above level of pore on prozonite of each segment a large spot formed by small fulvous areas, a similar areolation of the prozonite in its anterior part down the sides. Anal scutum and valves dark excepting a narrow caudal border. Collum with black anterior and posterior bordering bands united below on each side. Head with a network of dark lines excepting a black area in frontal region, which sends a branch to each eye and bifurcates below. Clypeal foveolae 5+5. Sulcus of head widely interrupted in the frontal region. Antennae slender, the second article but little exceeding the third in length. Collum with anterior margin incurved opposite each cardo; lower angle or process curved back a little distance over the second segment, the posterior margin just above it being concave. Segments constricted caudad of middle, the furrows pronounced. Surface of segments in general smooth, punctate at most few and very vague. Anal valves broadly rounded, the mesal edges meeting in a pronounced groove. The coxal plate of anterior gonopods with distal margin nearly straight, its distomesal corner a little elevated, rounded; exceeding the median plate a little. Number of segments, forty.

Length (male), about 24 mm.; width, 2.8 mm.

Locality.—California: Santa Ynez Mountains, Cold Spring Canyon. (W. M. Wheeler).